



Monoclonal Antibodies Treatment

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Abstract

Antibodies are naturally produced by the immune system when it detects something harmful. Antibodies are the proteins which act to certain infection by attaching themselves to antigens. The synthetic antibodies are produced in the laboratory which act against proteins that attack normal tissues. Production of synthetic antibodies involves introducing human genes that produce antibodies into mice or any another suitable mammal and later those mice are vaccinated with the antigen for which antibodies are required to be produced, which leads to the production of desired human antibody by the immune cells of the mice. These synthetic antibodies which are produced in the lab are termed as monoclonal antibodies which are synthesized from cloned immune cells. The use of monoclonal antibodies in treating a disease is called immunotherapy where each type of monoclonal antibody is produced to target a specific antigen in the body.

Monoclonal antibodies can be used in cancer therapy in different ways. For example, they are used to inhibit the activity of abnormal proteins in cancer cells which is known as a targeted therapy in which it targets a cancer's specific genes, proteins, or the tissue environment that is required by the tumor to grow and survive. Monoclonal antibodies can boost your immune system by inhibiting the immune checkpoints. An immune checkpoint is generally used by the body to naturally inhibit the immune system's response which prevent attacking healthy cells. Cancer cells have ways to hide from the immune system by initiating these checkpoints. Checkpoint inhibitors help in stopping the ability of cancer cells to inhibit the immune system from activating, and amplify body's immune system and destroy cancer cells. General checkpoints that the inhibitors affect are the PD-1/PD-L1 and CTLA-4 pathways.

To treat the cancer cells monoclonal antibodies block the receptor

which the cancer cells use to prevent the immune system from destroying them. Inhibition of these receptors allow the immune system to identify the cancer cells and destroy them. The rejection of tumour cells involves set of events which involves several types of leukocytes. Molecular and cellular networks which are involved in the response can be artificially altered with mAbs which act on indicated surface glycoproteins. An optimal immune response is activated by an mature dendritic cell, indicating optimal levels of antigen in lymphoid tissue. CD4+ and CD8+ lymphoblasts are generated and regulated that sets the threshold of activation, prevents over activation of the system and limits the size of clonal expansion. Natural killer (NK) cells leads to the anti-tumor response by promoting inflammation, activating DCs and tumourlysis. Immune response towards tumor antigens is held in lymphoid tissue and activate lymphocytes which infiltrate tumor tissue to mediate tumour cell destruction. Several suppressive mechanisms are involved to limit this process which is mediated by regulatory T cells (TRegcells), myeloid cells which are present at the tumour site and soluble factors such as transforming growth factor- β (TGF β), interleukin 10 (IL10) and vascular endothelial growth factor (VEGF). Molecular targets for immunostimulatory mAbs are indicated by an antibody pointing to the name of each molecule. Immunostimulating mAbs can be divided into which are indicated by colours: (red) mAbs which promote the function of a lymphocyte receptor present in immune activation; (blue) mAbs that involve in function of a lymphocyte receptor which is involved in inhibiting or regulating the immune response; (green) mAbs, promote the function of the antigen-presenting cells (APCs); (purple) mAbs which are with inhibitory molecules which are expressed by the cells in the tumor microenvironment.

Each and every monoclonal antibodies have their own side effects some of the common side effects are Allergic reactions, Chills, Weakness, Diarrhea, Nausea, Vomiting, Rash, Itching, High blood glucose levels, Cough, Constipation.

Keywords

Monoclonal; Cancer treatment; Antibiotic's

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